

32. On some Abnormalities in the Carnivora. By CHARLES F. SONNTAG, M.D., F.Z.S., Anatomist to the Society.

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(Text-figures 64-65.)

The following abnormalities were seen in animals dissected in the Society's Prosectorium during the past two years. They consist of:—

1. Elongation and contortion of vessels and nerves in the neck of a Bengal Fox (*Canis bengalensis*).
2. The occurrence of two separate precaval veins in a Panda (*Ailurus fulgens*).
3. Abnormal modes of termination of the vertebral veins of a Common Badger (*Meles meles*).

These conditions were compared with the normal state of the vessels, which is identical in all three animals.

*The Normal Blood-vessels.*

The aortic arch gives off the innominate and left subclavian arteries, and the former divides into the right subclavian and right common carotid arteries after giving off the left common carotid. The common carotid arteries run antero-laterally, and then straight forwards. The internal jugular veins are on their lateral aspects, and the vago-sympathetic nerve-cords lie on their dorsal surfaces.

The external jugular veins unite with the subclavian veins to form the innominate veins, of which the left one runs obliquely across the anterior part of the thorax and joins the more vertical right vein to form the precaval vein. The vertebral veins open by single trunks into the innominate veins.

The vena azygos major opens into the right side of the precaval vein immediately anterior to the root of the right lung.

*Abnormalities in a Bengal Fox (text-fig. 64).*

The animal, which was young, poorly-nourished, and rachitic, had a symmetrical and uniform enlargement of both lateral thyroid lobes (text-fig. 64, A.A), and the thymus gland was well-developed. The former were about twice the size of the lobes in a normal adult male. The isthmus of the thyroid gland was normal.

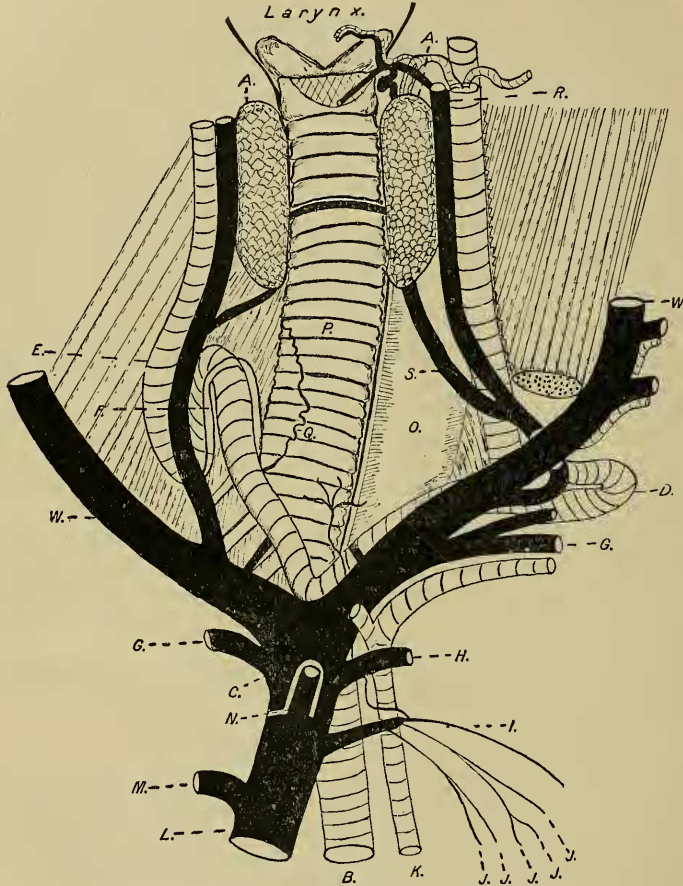
The innominate artery (B) divided in the normal manner, but the right subclavian artery was concealed by the right innominate vein (C).

The left common carotid artery (D) has a more horizontal course than the right one (E), and describes a very acute flexure with the convexity to the left. The right common carotid artery is not only flexed, but recurved, with the result that there is an S-shaped flexure. The left vago-sympathetic cord runs a

straight course on the dorsal surface of the left artery, but the right cord (F) follows the right carotid in its wanderings, and appears on the surface for a short distance.

No growths or adhesions are present in the root of the neck which could be responsible for distortion of the vessels and

Text-figure 64.



The vessels of the neck and thorax of *Canis bengalensis*.  
For explanation of letters see Text-figure 65.

nerves. All other vessels and nerves are normal as regards their course.

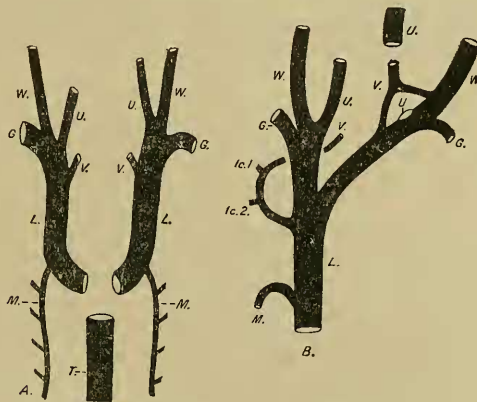
The precaval vein (L) receives internal mammary (N), pericardiac (J), and azygos veins (M), and a vein from the diaphragm running along the surface of the left phrenic nerve (I). No phrenic vein accompanied the right phrenic nerve.

*The Occurrence of Two Precaval Veins in a Panda* (text-fig. 65 A).

The innominate veins were formed as usual, but soon gave way to two precaval veins (L.L). The latter at first ran posteriorly and slightly mesially to points level with the anterior limit of the heart, when they turned directly inwards and ran horizontally; in this part of their course each vein receives an azygos vein (M). The orifices of the two precaval veins and the wide postcaval vein (T) form the angles of a triangle with the apex posterior.

This arrangement of the precaval and postcaval veins is the rule in Marsupials, but it occasionally occurs in higher Mammals. The chief difference between the condition described above and

Text-figure 65.



The veins of *Ailurus fulgens* (A) and *Meles meles* (B).

*Explanation of Letters.*

G. subclavian veins; H. intercostal vein; Ic.1 and Ic.2. intercostal veins; O. oesophagus; P. trachea; Q. right recurrent laryngeal nerve; R. internal jugular vein; S. inferior thyroid vein; U. internal jugular vein; V. vertebral vein; W. external jugular vein. Other letters in text.

that of the Marsupials lies in the nature of the terminal orifices. In the latter the openings are closer together, and the postcaval and right precaval veins are only separated by a crescentic fold. In the former they are wider apart, and the crescentic fold is not present.

In the process of development the anterior cardinal veins from the head and the posterior cardinal veins from the body unite to form the Ducts of Cuvier, which open into the sinus venosus. The anterior cardinal veins become united by a transverse vessel, which takes a gradually increasing share in returning the blood from the left side of the head. Eventually the part of the left anterior cardinal vein between this vein and the sinus venosus

atrophies, and the blood is conveyed entirely to the vein of the right side. The part of the right anterior cardinal vein between the cross vein and the sinus venosus becomes the precaval vein of the normal animal.

I believe that the persistence of two precaval veins in this animal is due to the non-formation of the cross vein.

No abnormality was found in the postcaval vein.

The veins of the father of this animal were quite normal.

*Abnormalities in the Vertebral Veins of a Badger* (text-fig. 65 B).

The left vertebral vein bifurcates in the lateral triangle of the neck; one of the divisions opens into the left external jugular vein, and the other one opens into the left innominate vein.

The right vertebral vein runs posteriorly dorsal to the right subclavian vessels, collects the veins from the first and second right intercostal spaces, and opens into the precaval vein.